IHEP(Beijing LCG2) Site Report

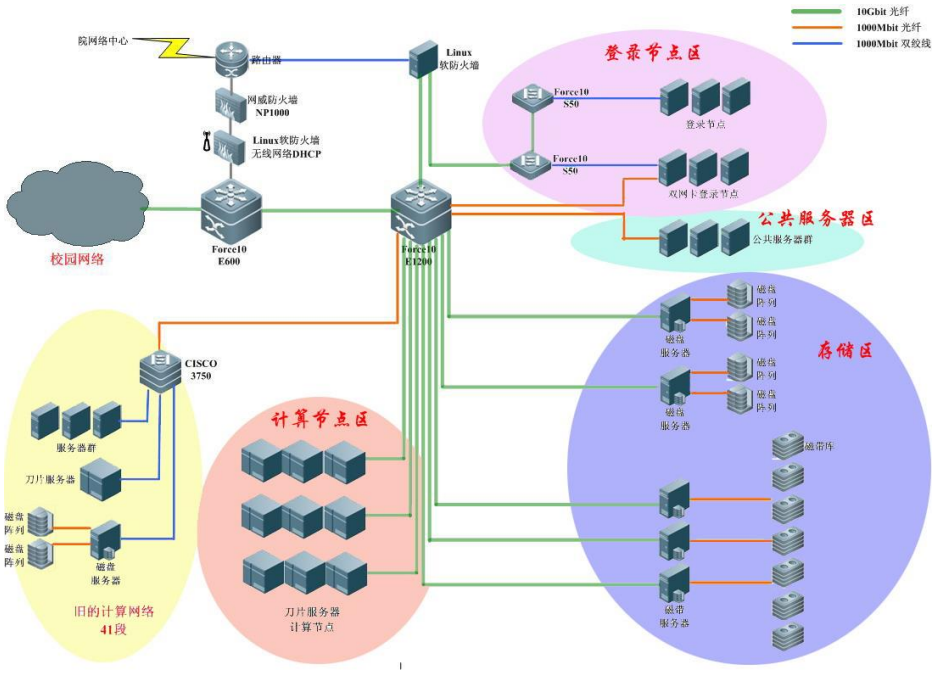
Fazhi.Qi, Gang Chen
Computing Center,IHEP

Outline

- Infrastructure
- Local Cluster Status
- LCG Tire2 Site Statistics
- Management & Operation
- Summary

Infrastructure

- Serving more than 1000 users
- Power supply capacity: 1800Kw
- Cooling: water cooling rack for the blade servers



Infrastructure Upgrade

Power Capacity: 1800kw

Cooling System

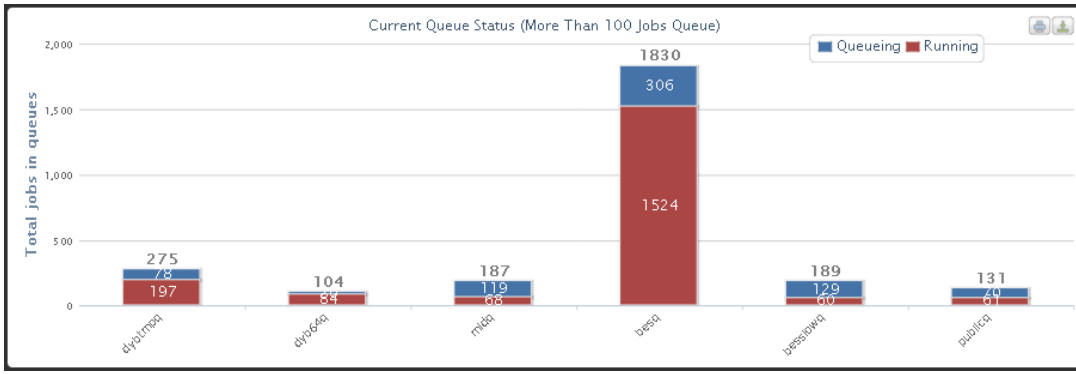
- Water cooling rack
  - Inter-row air conditioning
  - Cooling capacity per rack: 28kw

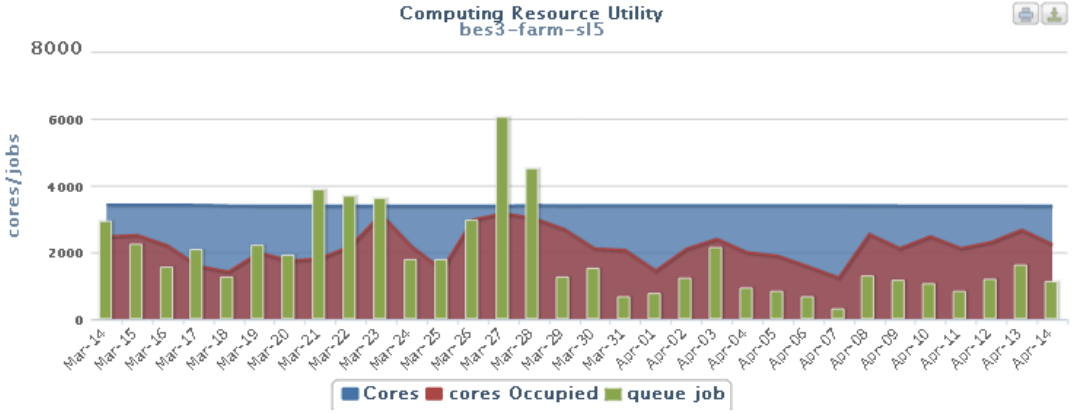
Local Cluster --Computing Nodes

- Most for BES,YBJ,DYB,Atlas,CMS experiments
  - Some small projects added
- Blade system IBM/HP/Dell
  - Blade links with GigE/IB
  - Chassis links to central switch with 10GigE
- 886 computing nodes: 7082 CPU-cores
  - Most running SL5.5 (64 bit)
    - Intend to migrate to SL5.8
  - A small part stayes in running SL4.5 (32 bit

Local Cluster -- Scheduler

- Torque: 2.5.5
- Maui: 3.2.6
  - Intend to upgrade to 3.4.4 or higher to support MPI jobs
- Tools developed to monitor the resources usage, queue status etc.
- Accounting tool developed





IHEP Cluster Running Statistic

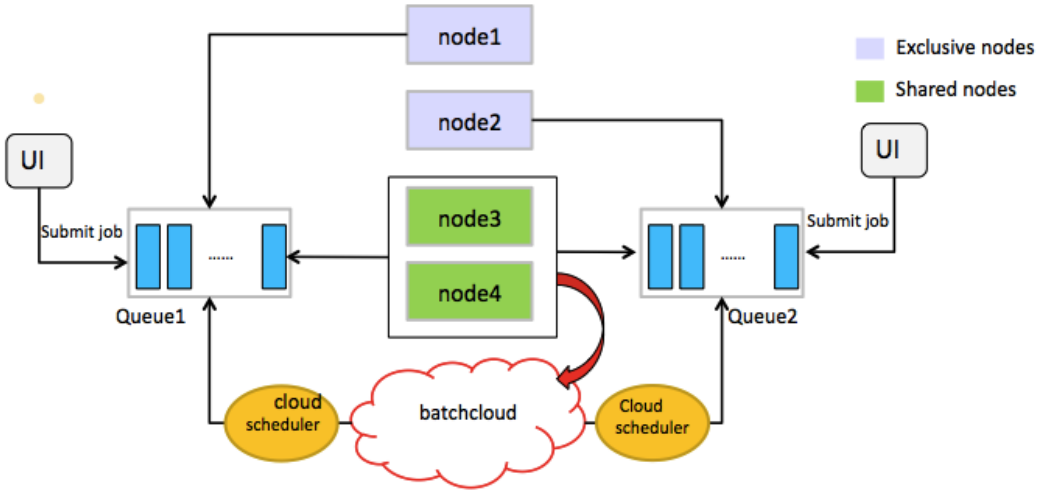
2013-04-14 -- 2013-04-14

Efficiency = CpuTime / Walltime Utility = Walltime / (WallTime+Del Job WallTime) Cpu InUtility = 1 - CpuUtility

Application	Job Walltime(h)	Job CPUTime(h)	Efficiency	Job Sum	CPU Utility	Del Job WallTime(h)	Del Job CPUTime(h)	Del Job Sum	CPU InUtility	
BES	17053.245	13107.329	0.769	2809	0.944	1004.032	992.832	121	0.056	Detail
DYW	3404.673	2789.142	0.819	980	1.000	0.000	0.000	0	0.000	Detail
PUBLIC	910.885	836.319	0.918	209	1.000	0.000	0.000	0	0.000	Detail
YBJ	699.665	729.899	1.043	160	0.871	103.291	101.302	23	0.129	Detail
ATLAS	248.141	40.177	0.162	100	1.000	0.000	0.000	0	0.000	Detail

Scheduler

- 50 queues to fit various requests
  - Besides serial jobs, MPI, GPU jobs are also supported
- Testbed
  - Integration of Torque and openstack
  - Managing and scheduling VM nodes in batch-cloud



Local Cluster -- Storage

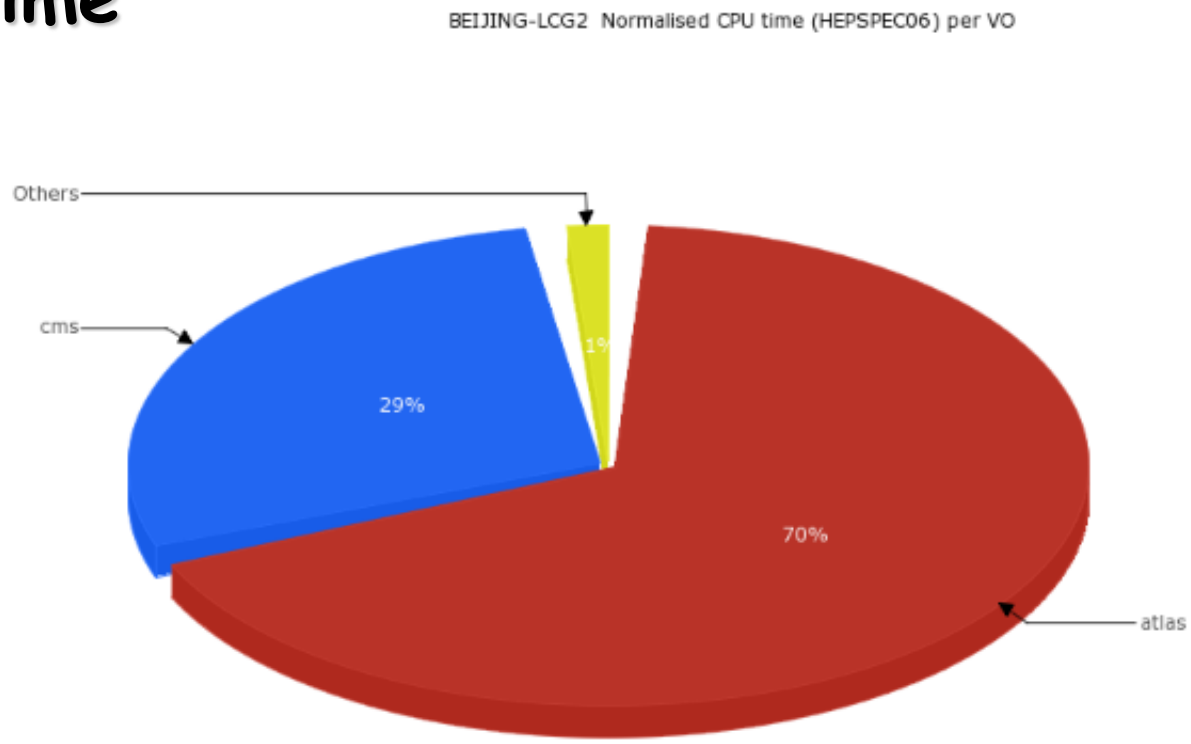
- Gluster system installed
- Storage provided less than 4 months
- Keeps optimizing performance
- Adjust to deal with the new bugs
- Total space: 153TB, Used space: 145TB

Beijing LCG Tier II Site

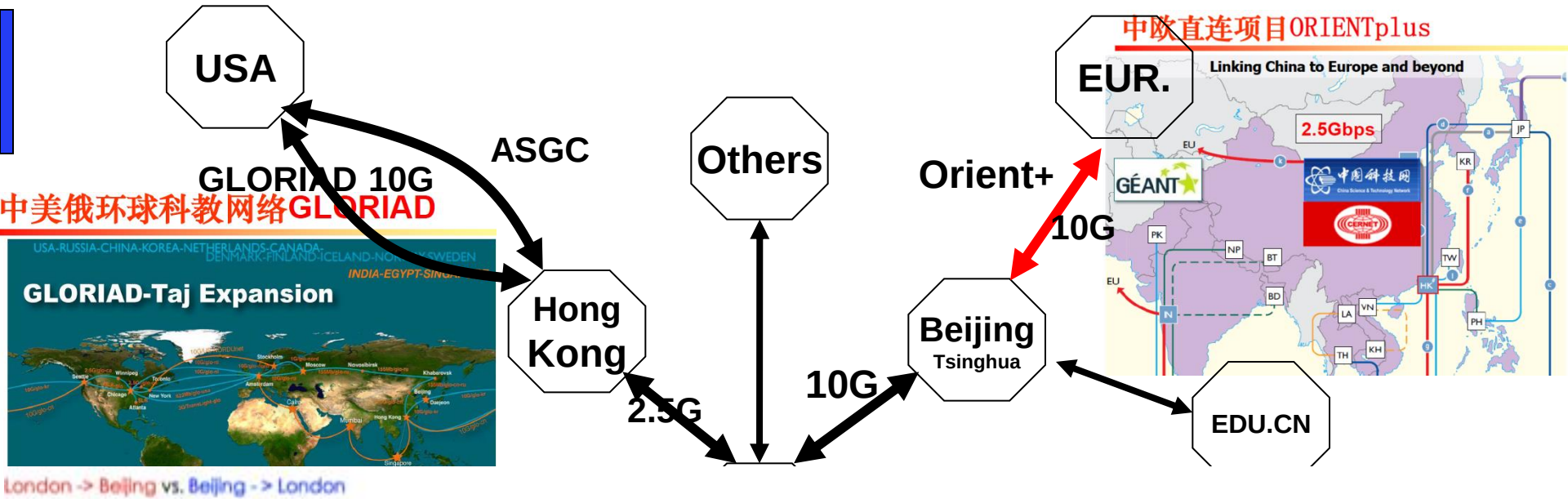
- For CMS, ATLAS experiments
- 1000+ Job slots
- Storage:
  - 320TB dCache
  - 320TB dpm
  - 1T disks were replaced by 2T disks

Beijing LCG Tier II Site

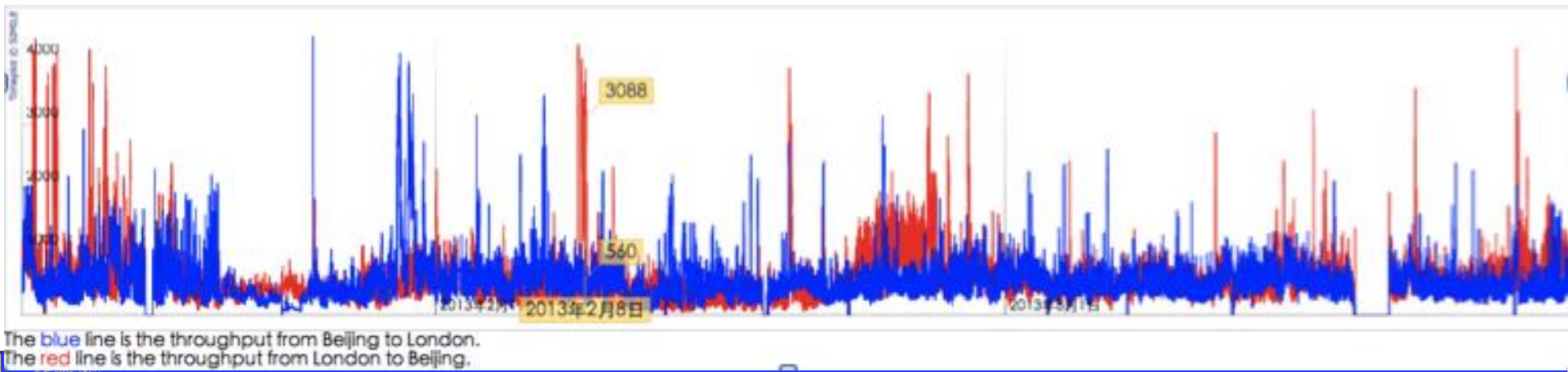
- CPU Time



Network Connection



London -> Beijing vs. Beijing -> London



The blue line is the throughput from Beijing to London.
The red line is the throughput from London to Beijing.

Perfsonar @IHEP

- Two hosts for perfsonar
  - Perfsonar.ihep.ac.cn for Bandwidth test
  - Perfsonar2.ihep.ac.cn for Latency test
- Network performance tuning is in progress between IHEP and EU. Sites
  - http://twiki.ihep.ac.cn/twiki/bin/view/InternationalConnectivity/IHEP-CCIN2P3

Scheduled Tests

FR Cloud BWCTL Mesh Test	Throughput Test
IHEP-BandWidth-TEST	Throughput Test

Add New Throughput Test | Add New Ping Test | Add New One-Way Delay Test | Add New Trac

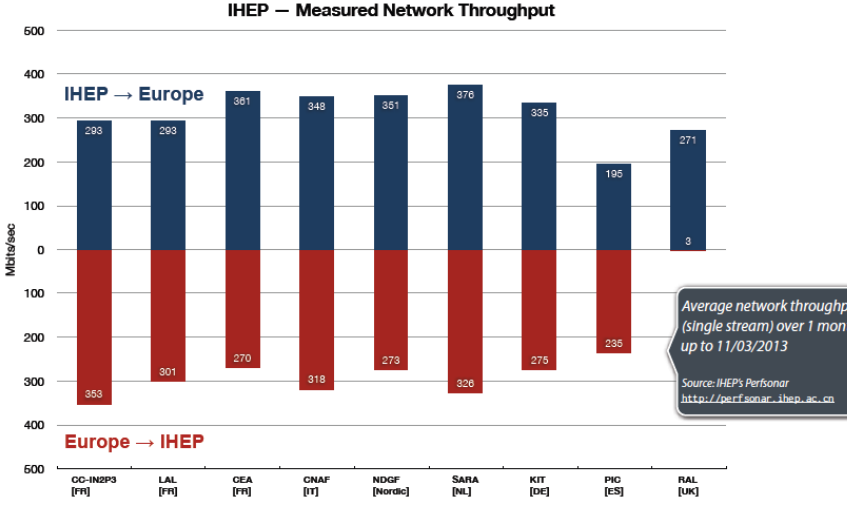
Configure BWCTL Tests Port Range

Test Parameters

Description	FR Cloud BWCTL Mesh Test
Test Duration (seconds)	30
Inter-Test Interval (seconds)	18000
Bandwidth Tester	Iperf
Protocol	TCP
Use Autotuning	yes
Edit Test Parameters	

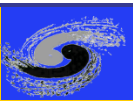
Test Members

lapp-ps01.in2p3.fr	IN2P3-LAPP Atlas Tier2 Bandwidth Host
perfsonar2.icepp.jp	Tokyo-LCG2 Tier2 Bandwidth Host
psonar2.lal.in2p3.fr	GRIF-LAL Atlas Tier2 Bandwidth Host
ccperfsonar1.in2p3.fr	CC-IN2P3 Tier2 Bandwidth Host
perfsonar02.datagrid.cea.fr	GRIF-IRFU Tier2 Bandwidth Host
lpnhe-psb.in2p3.fr	GRIF-LPNHE Atlas Tier2 Bandwidth Host
atrogr009.nipne.ro	RO-02-NIPNE Tier2 Bandwidth Host
perfsonar.ihep.ac.cn	BEIJING-LCG2 Tier2 Bandwidth Host

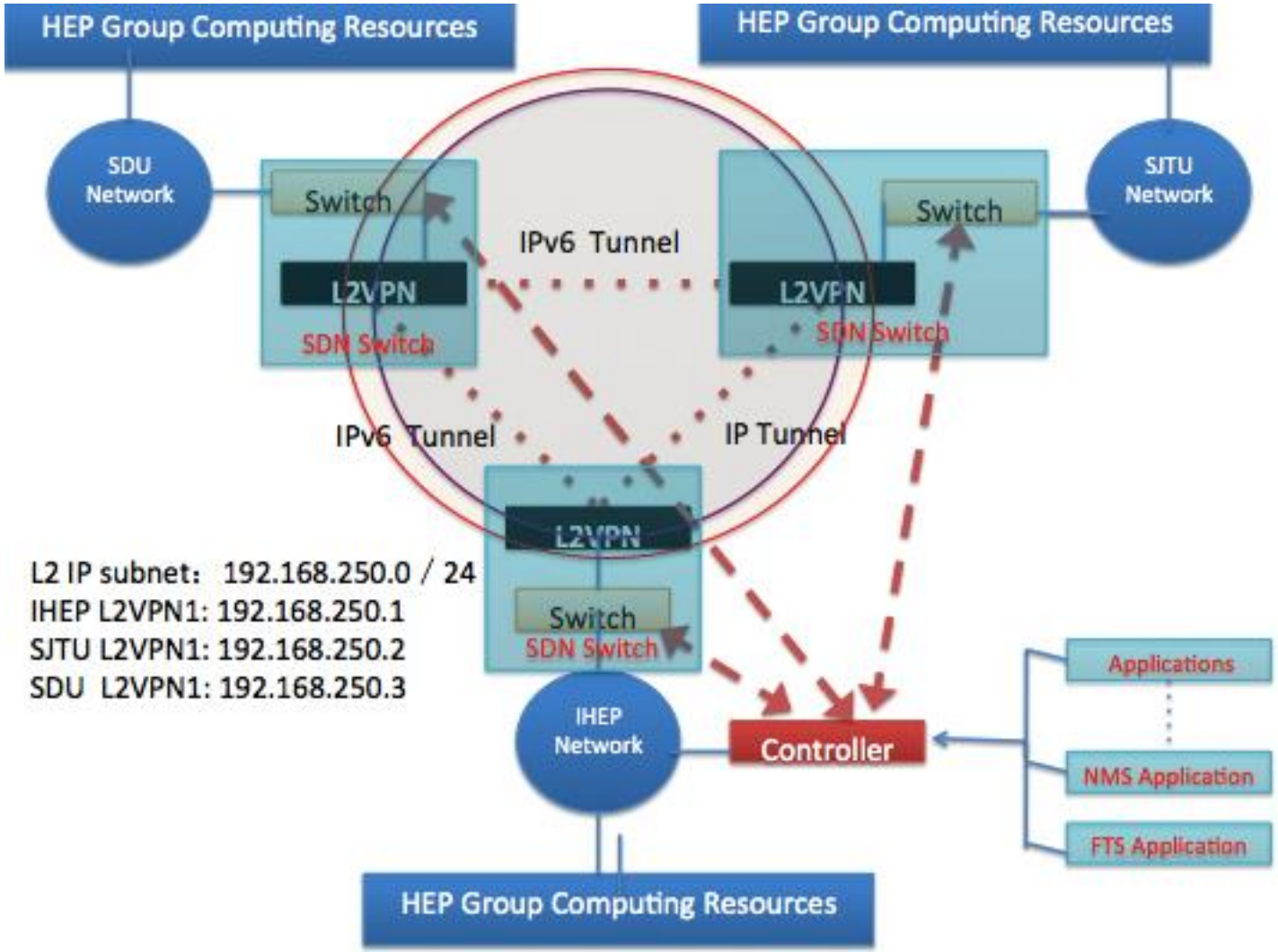


Network Research (SDN@IHEP)

- Goal
  - A flexible, reliable and high performance HEP data transfer network (virtual and private) and system platform in China
  - IPv4 and IPv6 supported
  - The traffic can be switched between IPv4 and IPv6 infrastructure and physical path automatically or manually based the network performance and applications
- SDN@IHEP → IHEPDTN
  - End user network
  - Backbone network(IPv6 & IPv4)
  - SDN Switch (L2VPN gateway & Openflow supported)
  - Control center (API to Application)
  - Applications(FTS/NMS/…….)
- Members
  - IHEP/SJU/SDU/TsingHua/……
  - Network Vendor:Ruijie Networks



SDN@IHEP model



Summary

- Most part of computing environment running well
- New gLuster system is in production
- Network performance between IHEP-Eur. got an clear improvement
- New Management and Operation system will be deployed to improve the efficiency

Thank you!

Questions?